

REMARKS

Claims 1-19 currently remain in the application. Claims 17-19 are newly added claims and claims 1-3 are herein amended.

Claim 1 was rejected under 35 U.S.C. 102 as being anticipated by Norimichi; claims 2 and 14 were rejected under 35 U.S.C. 103 over Norimichi in view of Kazuhiko; claim 13 was rejected under 35 U.S.C. 103 over Norimichi in view of Kazuhiko; claim 3 was rejected under 35 U.S.C. 103 over Norimichi in view of Taomoto; claims 4 and 16 were rejected under 35 U.S.C. 103 over Norimichi in view of Kazuhiko and Taomoto; claims 5-8 were rejected under 35 U.S.C. 103 over the references as applied to claims 1-4 above; claims 9-12 were rejected under 35 U.S.C. 103 over the references as applied to claims 1-4 above and further in view of Hirose; and claim 15 was rejected under 35 U.S.C. 103 over Norimichi in view of Taomoto and Kazuhiko. At least in part in view of the reasons for the Examiner's rejection, independent claims 1-3 are herein amended and new claims 17-19 are herein added. For the reasons to be presented below, it is believed that the amendment effected herein will overcome the Examiner's rejection.

The invention by Norimichi relates to flexible graphite sheet material comprising thermal expansion vapor deposited graphite fibers with a thermal conductivity of $120\text{Kcal}/(\text{m}\cdot\text{Hr}\cdot^{\circ}\text{C})$ or more in a direction parallel to the surface. It describes, as its Example 1, a flexible graphite sheet material comprising entirely of thermal expansion vapor deposited graphite fibers with a thermal conductivity of $600\text{Kcal}/(\text{m}\cdot\text{Hr}\cdot^{\circ}\text{C})$, or $697\text{W}/(\text{m}\cdot\text{K})$. Example 2 of Norimichi, however, relates to a flexible graphite sheet material which is a mixture of thermal expansion graphite generated from natural graphite and thermal expansion vapor-deposited graphite fibers at a ratio of 9:1. For this sheet according to Example of Norimichi, the thermal conductivity in the direction parallel to the surface is only $140\text{Kcal}/(\text{m}\cdot\text{Hr}\cdot^{\circ}\text{C})$, or $163\text{W}/(\text{m}\cdot\text{K})$. It is also to be noted that Norimichi does not disclose any example of a flexible graphite sheet material generated from thermal expansion graphite and having a thermal conductivity of $350\text{W}/(\text{m}\cdot\text{K})$ in a direction parallel to the surface.

Next, the invention by Norimichi will be compared with the present invention, The vapor-deposited graphite fibers used in the examples by Norimichi have a higher thermal

conductivity than natural graphite, and the thermal expansion graphite generated from such vapor-deposited graphite fibers has a higher thermal conductivity than the thermal expansion graphite generated from natural graphite. Norimichi uses thermal expansion graphite generated from natural graphite to make a sheet by adding 10% of thermal expansion graphite generated from thermal expansion vapor-deposited graphite fibers as described above but the thermal conductivity of the sheet thus obtained is only $163\text{W}/(\text{m}\cdot\text{K})$, far below the level of $350\text{W}/(\text{m}\cdot\text{K})$ which is the thermal conductivity of the graphite sheet according to the present invention.

In other words, Norimichi is indicating that it is not possible to obtain any graphite sheet with thermal conductivity of $163\text{W}/(\text{m}\cdot\text{K})$, much less that with thermal conductivity in excess of $350\text{W}/(\text{m}\cdot\text{K})$, by using only thermal expansion graphite generated from natural graphite. In still other words, Norimichi is teaching that graphite sheets having a high thermal conductivity in excess of $350\text{W}/(\text{m}\cdot\text{K})$ can be obtained only by using thermal expansion vapor-deposited graphite fibers having a high thermal conductivity. This is to say that Norimichi is not suggesting or hint at the present invention which relates to a graphite sheet having a thermal conductivity high than $350\text{W}/(\text{m}\cdot\text{K})$, principally comprising thermal expansion graphite generated from natural graphite.

Kazuhiko relates to a reflector for reflecting electromagnetic waves and discloses as Example 1 a thermal expansion graphite sheet with surface roughness $R_a = 1.0\mu\text{m}$ but there is no description which relates to the effect of the surface roughness of a sheet on its thermal conductivity although the effects of the surface roughness of the sheet on reactions with other materials are being considered.

Taomoto relates to the technology of rolling a sheet by preventing the occurrence of lines. Although it describes how the thermal conductivity can be improved over manual operations, there are detailed descriptions of thermal conductivity. While the present invention relates to the prevention of occurrence of heat spots caused by positional unevenness in thermal conductivity of a sheet by regulating the conditions on local thermal conductivities with respect to the average thermal conductivity, there is no description even hinting at such conditions.

For these reasons, it is believed that the present invention will not be obviously achievable even if the references cited by the Examiners are considered in combination. It is

therefore believed that the application is now in condition for allowance.

It is requested that the Examiner issue at least an advisory action, if not a notice of allowance, in a seasonable manner in view of the mailing of the instant Amendment within two months of the mailing date of said Final Office Action.

Respectfully submitted,
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